

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NORTH DAKOTA
NORTHWESTERN DIVISION

Energy Heating, LLC, an Idaho limited
liability company; Rocky Mountain Oilfield
Services, LLC, an Idaho limited liability
company,

Plaintiff/Counterclaim Defendants,

vs.

Heat On-The-Fly, LLC, a Louisiana limited
liability company, and Super Heaters North
Dakota, a North Dakota limited liability
company,

Defendants,

and

Heat On-The-Fly, LLC, a Louisiana limited
liability company,

Counterclaimant.

Heat On-The-Fly, LLC, a Louisiana limited
liability company,

Third-Party Plaintiff /Counterclaim
Defendant,

vs.

Marathon Oil Corporation,

Third-Party Defendant/
Counterclaimant.

Civil Case No. 4:13-cv-10

Claim Construction on U.S. Patent No. 8,171,993 B2 (“the ‘993 Patent”)

This matter is before the Court on the issue of patent claim construction pursuant to

Markman v. Westview Instruments, Inc.¹ A Request for Ex Parte Reexamination of the '993 Patent was filed by an unnamed third party on September 14, 2012, requesting reexamination of Claims 1-12 of the '993 patent.² The United States Patent and Trademark Office ("USPTO") issued an Order Granting the Request for Ex Parte Reexamination on December 7, 2012, stating that a substantial new question of patentability is raised for all claims identified in the Request. Reexamination of the '993 Patent is currently pending before the USPTO.

On April 17, 2014, Defendants Heat On-the-Fly, LLC and Super Heaters; Third-Party Defendant Marathon Oil Corporation (hereafter "Marathon"); and Plaintiff Energy Heating, LLC (hereafter "Energy Heating") filed their claim construction briefs.³ A Markman hearing was held on May 15, 2014, on six jointly-identified disputed claim terms. A seventh disputed term was added by Defendants in their opening claim construction memorandum.⁴

At the Markman hearing, the parties indicated a willingness to defer construction of the seventh disputed claim term - "flowline" - until a later date. The Court defers construing the term "flowline" until the issue becomes ripe, i.e. in a summary judgment motion or other subsequent motion after which each party has had an adequate opportunity to brief their arguments regarding the proper construction of the term. With regard to the other disputed claims, while six are identified by the parties, only two of the terms - "mixer" and "turbulent flow" are contentious. The other four terms need not be construed, as the Court finds they ought

¹ 517 U.S. 370 (1996).

² Doc. #27, Amended Complaint, ¶ 11; Doc. #28, Answer to Amended Complaint ¶ 11.

³ Docs. #158, 160, & 161.

⁴ Doc. #158.

to be controlled by their plain and ordinary meaning.

BACKGROUND

In applying the Phillips⁵ methodology, the Court's recitation of the factual background focuses on the patent-in-suit, including the words of the patent claims at issue in this infringement suit. The prosecution history is not recounted here. Any pertinent parts of the prosecution history is reserved and will be recounted when, and if, resort to the prosecution history for guidance is appropriate.

1. The parties

Plaintiff Energy Heating is an Idaho limited liability company with its principle place of business in Burley, Idaho.⁶ Plaintiff Rocky Mountain Oilfield Services, LLC is an Idaho limited liability company with its principle place of business in Belfield, North Dakota.⁷ Plaintiffs Energy Heating and Rocky Mountain are joint venturers delivering water in North Dakota. They have been accused of using allegedly infringing portable water heaters.⁸ Plaintiffs have prophylactically brought this action for a judicial determination to counter Defendants' accusations to others in the hydraulic fracturing industry that Plaintiffs are infringing on its patent.

Defendant Super Heaters is a Texas limited liability company existing under the laws of the States of Texas and North Dakota. Super Heaters has provided heated water for hydraulic fracturing operations in North Dakota for several years.⁹ Defendant Heat-On-The-Fly

⁵ Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005).

⁶ Doc. #27, First Amended Complaint.

⁷ Id. at ¶ 2.

⁸ Id. at ¶ 3.

⁹ Id. at ¶ 4.

(“HOTF”), a Louisiana limited liability company, is a licensing company formed in 2010 for the purpose of licensing the water heating method used by Super Heaters.¹⁰

2. The patent-in-suit

a. Inventors and Dates of Filing and Issuance

Ransom Mark Hefley, Elk City, Oklahoma, is the inventor of Patent No. 8,171,993B2 (“the patent-in-suit” or “the ‘993 Patent”).¹¹ The ‘993 Patent has been assigned to HOTF.¹² The application was filed on July 23, 2010, and issued on May 8, 2012.¹³

b. Abstract

The Abstract describes the invention as “[a] method of hydraulic fracturing of an oil producing formation [that] includes the provision of a heating apparatus which is transportable and that has a vessel for containing water.”¹⁴ More specifically, the Abstract explains that cool or cold water is transmitted from a source to a mixer.¹⁵ The mixer has an inlet for receiving the cool or cold water and an outlet enabling a discharge of a mix of the cool or cold water and the hot water.¹⁶ The outlet discharges the mixed water to surge tanks or to mixing tanks.¹⁷ While in

¹⁰ Id. at ¶ 5.

¹¹ Doc. #1-1, p. 1.

¹² Id.

¹³ Id.

¹⁴ Doc. #1-1, p. 2, par. 57.

¹⁵ Id.

¹⁶ Id.

¹⁷ Id.

the mixing tanks, a proppant and selected chemical(s) are added to the warmed water.¹⁸ From the mixing tanks, the water with proppant and chemical(s) is injected into a well for use in the hydraulic fracturing operation.¹⁹

c. Drawings

The '993 Patent contains 11 drawings, including a three-dimensional drawing of a mixer, a cross-section of a mixer, a schematic diagram of prior art, and schematic diagrams identifying alternatives of the subject invention. With regard to the mixer, the cross-section illustrates a main intake opening and an outflow opening, allowing the source water to flow through the mixing manifold to the frac tanks.²⁰ Between the intake opening and the outflow opening, the cross-section identifies a conduit to allow for the diversion of a portion of the source water to be directed through piping to a heating unit and a separate conduit to allow the reintroduction of superheated water into the bore of the mixer.²¹

The cross-section further illustrates, and the patent specification explains, that a partial blockage or impediment on the backside of the cold water diversion opening diverts a portion of the cold water to the piping and ultimately the heating unit, and its purpose is also to create turbulence in the source water flow to aid in mixing.²² In addition, a hot water return opening for attachment of piping for the superheated water is preferably located downstream from the cold water diversion opening, allowing the heated water into the mixer to mix with the cold water

¹⁸ Id.

¹⁹ Id.

²⁰ Id. at p. 5, Fig. 2; see also, Doc. #1-1, p.16, column 3, lines 37-39.

²¹ Id. at Fig. 2; see also, Doc. #1-1, p.16, column 3, lines 39-43.

²² Id. at Fig. 2; see also, Doc. #1-1, p.16, column 4, lines 22-32.

stream and uniformly raise the temperature of the water.²³ The turbulence referenced in the specification is denoted with curved, circular arrows.

d. Background of the Invention

The Background of the Invention provides some further context to the subject invention. According to the inventor, hydraulic fracturing generally involves injecting fluid at a sufficient rate and pressure to overcome the tensile strength of the sand or shale formations and thus create cracks or fractures thereby creating the permeability required to enhance hydrocarbon production.²⁴ A key element of the fracturing fluid is water – the carrying fluid for the proppant and other optional chemical(s).²⁵ Before injection into the well, however, the water is heated to a target temperature, which is determined based on the geologic formation and chemicals used.²⁶

The Background explains that the manner in which the water is heated in the subject invention is distinguishable from common and known industry methods in a manner where the subject invention seeks to reduce expense and energy waste.²⁷ For example in prior art, water is pumped into several frac tanks and then the water from each tank is circulated through a heating unit to raise the temperature to a preset level.²⁸ The water is typically heated the night before the

²³ Id. at Fig. 2; see also, Doc. #1-1, p. 16 column 3, lines 43-48.

²⁴ Doc. #1-1, p. 15, column 1, lines 45-52.

²⁵ Doc. #1-2, p 15, column 1, lines 60-62.

²⁶ Doc. #1-1, p. 15, column 1, lines 65-67; column 2, line 1.

²⁷ Doc. #1-1, p. 15, column 2, lines 18-19, 31-35.

²⁸ Doc. #1-1, p. 15, column 2, lines 20-24.

fracing operations.²⁹ Because of the time lapse, thermal loss occurs.³⁰ As a result, the water is heated to temperatures of 10-50°F higher than is operationally necessary.³¹

In contrast to the prior art, in the patent-in-suit superheated water is mixed with continuously flowing source water in order to provided “on-demand” heated water flow for use in hydraulic fracing without the need to overheat the water.³²

e. Brief Summary of the Invention

The Brief Summary of the Invention outlines the embodiments of the invention’s requirements: a water source, pumps and piping that can provide continuous delivery of water, a mixer or mixing manifold, and frac tanks or mixing tanks.³³ The Summary explains that there are “numerous other conceivable arrangements and configurations of the inflow and outflow of the cold water and hot water and piping in the mixing manifold.”³⁴ Generally, however, the steps are identified as follows: (1) establishing a flow of source water of between about 20 - 150 + barrels per minute through piping to a piping manifold or mixer, which diverts a portion of the source water to one or more heating units; (2) returning the superheated water to the continuous flowing source water to meet the target temperature; and (3) transferring the warmed water to the mixing tanks for chemical additives and the eventual fracing process.

²⁹ Doc. #1-1, p. 15, column 2, lines 24-25.

³⁰ Doc. #1-1, p. 15, column 2, lines 24-26.

³¹ Doc. #1-1, p. 15, column 2, lines 26-29.

³² Doc. #1-1, p. 15, column 4, lines 4-6.

³³ Doc. #1-1, p. 15, column 2, lines 55-60; p. 16, column 3, lines 48-50.

³⁴ Doc. #1-1, p. 17, column 5, lines 25-27.

f. Detailed Description of the Invention

The '993 Patent contains several schematic drawings of preferred embodiments of the subject invention as well as alternative embodiments of the subject invention.³⁵ According to the description, the mobile heater apparatus used to superheat the water includes a truck and trailer.³⁶ One of the essential components of the subject invention is a mixer. The mixer identified in the subject invention is capable of receiving ambient temperature from a water source and combining the source water with very hot water.³⁷ The mixer is tubular or cylindrically-shaped with an inlet accepting water and outlet discharging water.³⁸ In addition, a pair of conduits - a second inlet and a second outlet - each have "an inner end portion" and "an outer end portion."³⁹ The first conduit removes ambient water from the tubular body, and the second conduit injects superheated water into the tubular body.⁴⁰ The Description indicates that the curved arrows on the drawing of the mixer are intended to demonstrate turbulent flow to ensure that heated water and ambient temperature water are mixed thoroughly.⁴¹

g. Claims

The '993 Patent identifies 99 claims.⁴² In their joint claim chart, the parties identified six

³⁵ Doc. #1-1, p. 17, column 6, lines 63-67; p. 18, column 7, lines 1-4.

³⁶ Doc. #1-1, p. 18, column 7, lines 9-10.

³⁷ Doc. #1-1, p. 18, column 7, lines 23-25.

³⁸ Doc. #1-1, p. 18, column 7, lines 26-30.

³⁹ Doc. #1-1, p. 18, column 7, lines 48-49.

⁴⁰ Doc. #1-1, p. 18, column 7, lines 37-40.

⁴¹ Doc. #1-1, p. 18, column 7, lines 33-35.

⁴² Doc. #1-1, p. 20-24.

claim terms, phrases, or clauses in dispute:⁴³

- (1) transportable heating apparatus;
- (2) mixer;
- (3) substantially continuously;
- (4) turbulent flow;
- (5) the transportable heating apparatus is a wheeled vehicle/
the heating apparatus is a wheeled vehicle; and
- (6) much greater.

Defendants HOTF and Super Heaters identified an additional claim term – “flowline” – that they believe is also in dispute.⁴⁴ Plaintiffs have requested that this Court decline to construe the untimely request.⁴⁵ At the Markman hearing, the parties indicated a willingness to defer construction of the term “flowline” to a later date. The Court hereby defers construing the term “flowline” until it becomes necessary and all parties have had an adequate opportunity to brief the issue.

DISCUSSION

1. Claim Construction Principles

Patent claim construction – the interpretation of the patent claims that define the scope of the patent – is a matter of law for the court.⁴⁶ “[T]he claims of a patent define the invention to

⁴³ Doc. #136-1.

⁴⁴ Doc. #158.

⁴⁵ Doc. #172.

⁴⁶ Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed. Cir. 1995), aff’d, 517 U.S. 370 (1996).

which the patentee is entitled the right to exclude.”⁴⁷ Claim construction requires an examination of the intrinsic evidence of record, including the claims of the patent language, the specification, and the prosecution history.⁴⁸ The starting point for claim construction is a review of the words of the claims themselves. The terms used in the patent are presumed to carry “the meaning that the term would have to a person of ordinary skill in the art at the time of the invention.”⁴⁹ Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, a court may look to the sources available to the public that show what a person of skill in the art would have understood the claim language to mean.⁵⁰ A court may use a dictionary to “assist in understanding the commonly understood meaning” of a term, so long as any meaning found in such sources does not contradict the definition that is found in the patent documents.⁵¹ In other words, a court must ensure that any reliance on dictionaries accords with the intrinsic evidence: the claims themselves, the specification, and the prosecution history.⁵²

Second, a court considers the entire specification to define technical terms that might not lend themselves to an ordinary meaning. The specification is “the single best guide to the meaning of a disputed term.”⁵³ The specification may prescribe a special definition given to a

⁴⁷ Phillips v. AWH Corp., 415 F.3d 1303, 1313 (Fed. Cir. 2005) (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc., 381 F.3d 1111, 1115 (Fed. Cir. 2004)).

⁴⁸ Vitronics Corp. v. Conceptiontronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996).

⁴⁹ Phillips, 415 F.3d at 1313.

⁵⁰ Id. at 1314.

⁵¹ Id. at 1322-23.

⁵² Id. at 1314.

⁵³ Id. at 1315.

claim term, or a disavowal of a claim scope by the inventor.⁵⁴ In such cases, the inventor's intention that is expressed in the specification is dispositive.⁵⁵ A court may not, however, import limitations from the specification into the claims.⁵⁶ To avoid importing limitations from the specification into the claims, a court considers that the purposes of the specification are to teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so.⁵⁷

Third, intrinsic evidence also includes the patent's prosecution history, which contains evidence of the United States Patent and Trademark Office ("USPTO") and the inventor's understanding of the patent.⁵⁸ The prosecution history includes the record of the proceedings before the PTO and any prior art cited by the applicant.⁵⁹ Because the prosecution history lacks the clarity of the specification, it is less useful.⁶⁰ Nevertheless, an explicit statement made by an applicant during the patent's prosecution may serve to narrow the scope of the claim.⁶¹ "The purpose of consulting the prosecution history in construing a claim is to 'exclude any interpretation that was disclaimed during prosecution.'"⁶²

⁵⁴ Id. at 1316.

⁵⁵ Id.

⁵⁶ Id. at 1323.

⁵⁷ Id.

⁵⁸ Id. at 1317.

⁵⁹ Id.

⁶⁰ Id.

⁶¹ Spectrum Int'l v. Sterilite Corp., 164 F.3d 1372, 1378-79 (Fed. Cir. 1988).

⁶² Research Plastics, Inc. v. Federal Packaging Corp., 421 F.3d 1290, 1296 (Fed. Cir. 2005) (quoting Rhodia Chimie v. PPG Indus., 402 F.3d 1371, 1384 (Fed. Cir. 2005)).

If after an examination of the intrinsic evidence the court finds the claim ambiguous, the court may look to extrinsic evidence, including expert and inventor opinions, treatises, and articles.⁶³ Courts are to look to extrinsic evidence as a last resort, as it is less reliable than intrinsic evidence.⁶⁴ In addition, extrinsic evidence must be considered in the context of intrinsic evidence.⁶⁵

2. Other Canons of Claim Construction

Apart from the evidence upon which claim construction may be based, claim construction involves various “canons.” One canon of claim construction is that “claim terms are presumed to be used consistently throughout the patent, such that the usage of a term in one claim can often illuminate the meaning of the same term in other claims.”⁶⁶ It follows then that “[w]hen different words or phrases are used in separate claims, a difference in meaning is presumed.”⁶⁷ Likewise, a court must interpret claims so that no term becomes “superfluous.”⁶⁸

Another canon of claim construction is that the patentee may act as “lexicographer.” In other words, “the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess,” and when that happens, the

⁶³ Phillips, 415 F.3d at 1317.

⁶⁴ Id. at 1317-18.

⁶⁵ Id. at 1318-19; Network Commerce, Inc. v. Microsoft Corp., 422 F.3d 1353, 1361 (Fed. Cir. 2005).

⁶⁶ Research Plastics, Inc., 421 F.3d at 1295.

⁶⁷ Nystrom v. TREX Co., Inc., 424 F.3d 1136, 1143 (Fed. Cir. 2005) (citing Tandon Corp. v. United States Int’l Trade Comm’n, 831 F.3d 1017, 1023 (Fed. Cir. 1987)).

⁶⁸ See Merck & Co. v. Teva Pharms. USA, Inc., 395 F.3d 1364, 2372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”).

patentee's definition must govern.⁶⁹ The authority of the specification as a source for definitions for claim terms, however, is not limitless. A court must take care not to import a limitation from the written description; instead, it must use the written description for enlightenment.⁷⁰

3. The Court's Independent Obligation to Construe Terms

The Federal Circuit Court of Appeals has expressly held that a court is free to adopt a construction independent of those suggested by the parties.⁷¹ Accordingly, the Court has an obligation to construe the patent terms independently, apply the Phillips methodology, and is not bound to adopt either party's proffered construction of any claim terms.

With these principles in mind, the Court turns to construction of the disputed claim terms of the '993 Patent.

4. The '993 Patent

The Court first looks to the words of the claims, giving them the plain meaning for a person of ordinary skill in the art in question at the time of the invention. Claims 1, 4, and 5 incorporate the disputed claim terms contained in the parties' joint statement. The claims, with emphasis identifying the disputed claim terms, are as follows:

1. A method of fracturing a formation producing at least one of oil and gas, comprising the steps of:

- a) providing a **transportable heating apparatus** for heating water to a temperature of at least about 40 degrees F. (4.4 degrees C.);
- b) transmitting a water stream of cool or cold water to a **mixer**, the cool

⁶⁹ Phillips, 415 F.3d at 1316.

⁷⁰ Playtex Prods, Inc. v. Proctor & Gamble Co., 400 F.3d 901, 906 (Fed. Cir. 2005) (citing Comark Communications v. Harris Corp., 156 F.3d 1182, 1186-87 (Fed. Cir. 1998)).

⁷¹ Exxon Chem. Patents, Inc. v. Lubrizol Corp., 64 F.3d 1553, 1555 (Fed. Cir. 1995).

or cold water stream being at a temperature of less than a predetermined target temperature;

- c) the **mixer** having a first inlet that receives cool or cold water from the stream of step “b” and a first outlet that enables discharge of a **substantially continuous** stream which is a mix of cool or cold and heated water;
- d) the **mixer** having a second inlet that enables heated water to enter the mixer;
- e) adding heated water from the transportable heating apparatus of step “a” to the **mixer** via the second inlet;
- f) wherein the volume of cool or cold water of step “b” is **much greater** than the volume of heater water of step “e”;
- g) adding a selected proppant to the mix of cool or cold and heated water discharged from the **mixer** after step “f”;
- h) transmitting the mix of cool or cold and heated water and the proppant into a formation producing at least one of oil and gas, wherein water flows **substantially continuously** from the first inlet to the first outlet during the fracturing process.⁷²

* * *

4. The method of claim 1 wherein the heated water and the cool or cold water mix in step “e” with **turbulent flow**.⁷³

5. The method of claim 1 wherein the **transportable heating apparatus is a wheeled vehicle**.⁷⁴

Having identified the disputed claim terms in context, the Court considers each term, beginning with the terms in which the Court finds no construction is necessary.

⁷² Doc. #1-1, p. 20, column 12, lines 29-55.

⁷³ Doc. #1-1, p. 20, column 12, lines 61-62.

⁷⁴ Doc. #1-1, p. 20, column 12, lines 63-64.

a. “Substantially Continuously”

Defendants contend that the ordinary meaning should apply to the claim term “substantially continuously”.⁷⁵ Plaintiffs’ and Marathon Oil initially asserted that the term is “incurably ambiguous”.⁷⁶ Since then Plaintiffs have conceded that the term may be governed by its ordinary meaning,⁷⁷ but reserve the right to argue that the term is incurably indefinite if the United States Supreme Court changes the indefiniteness standard.⁷⁸ Marathon Oil also agrees that the term “substantially continuous” should be interpreted according to its ordinary meaning.⁷⁹ In light of the parties’ joint agreement to apply the ordinary meaning of the term “substantially continuously”, the Court declines to construe the term.

b. “Much Greater”

Defendants contend that the ordinary meaning should apply to the claim term “much greater”.⁸⁰ Plaintiffs and Marathon Oil initially asserted that the term is “incurably ambiguous”.⁸¹ Since then Plaintiffs have conceded that the term may be governed by its ordinary meaning,⁸² but reserve the right to argue that the term is incurably indefinite if the

⁷⁵ Doc. #136-1, p. 6 of 11.

⁷⁶ Id.

⁷⁷ Doc. #161, p. 11 of 14.

⁷⁸ Doc. #172, p. 11 of 14.

⁷⁹ Doc. #160, p. 11 of 13.

⁸⁰ Doc. #136-1, p. 10 of 11.

⁸¹ Id.

⁸² Doc. #161, p. 11 of 14.

United States Supreme Court changes the indefiniteness standard.⁸³ Marathon Oil also agrees that the term “much greater” should be interpreted according to its ordinary meaning.⁸⁴ In light of the parties’ joint agreement to apply the ordinary meaning of the term “much greater”, the Court declines to construe the term.

c. “Transportable Heating Apparatus”

“Transportable Heating Apparatus” is an embodiment identified in the claims.⁸⁵ The Abstract defines the invention as a “method of hydraulic fracturing . . . [which] includes the provision of a heating apparatus which is transportable and that has a vessel for containing water.”⁸⁶

Defendants argue the term does not need to be construed, and should be given its plain and ordinary meaning. Plaintiffs and Marathon Oil propose the following construction: “A moveable machine or group of machines used to heat water.” Plaintiffs and Marathon Oil contend that the term must be construed to make clear that the transportable heating apparatus can include one or more machines to heat the water.

The starting point for claim construction is a review of the words of the claims. The terms used in the patent are presumed to carry “the meaning that the term would have to a person of ordinary skill in the art at the time of the invention.”⁸⁷ A patentee may only overcome the

⁸³ Doc. #172, p. 11 of 14.

⁸⁴ Doc. #160, p. 11 of 13.

⁸⁵ See Claim 1(a); Claim 13(a); Claim 26(a); Claim 63(a); But See, Claim 36(a) and Claim 86(a) (which provides for “a heating apparatus”).

⁸⁶ Doc. #1-1, p. 2, ¶ 57.

⁸⁷ Phillips, 415 F.3d at 1313.

“heavy presumption” in favor of the claim term’s ordinary meaning if a different meaning is “clearly and deliberately set forth in the intrinsic evidence.”⁸⁸

The Court appreciates that inventors may act as their own lexicographer and give a common word or phrase a meaning that is very specific and different from the normal definition of a word or phrase.⁸⁹ When analyzing the patent-in-suit, there is nothing in the intrinsic evidence to suggest that the inventor used the term “transportable heating apparatus” in a manner different from ordinary, common usage. Contrary to Plaintiffs’ and Marathon Oil’s suggestion, the plain meaning of “apparatus” is not limited to the singular. The common meaning of “apparatus” includes “a collection or set of . . . instruments . . . designed for a particular use.”⁹⁰ Moreover, the first step in the subject invention provides for “a transportable heating apparatus for heating water to a temperature of at least about 40 degrees F.”⁹¹ A general “rule” in claim construction is that the indefinite article “a” or “an” means “one or more.”⁹²

Plaintiffs’ and Marathon Oil’s proposed construction adds nothing to the plain language of the claims. A person of ordinary skill in the art would understand the term “transportable

⁸⁸ Union Carbide Chemicals & Plastics Technology Corp. v. Shell Oil Co., 308 F.3d 1167, 1177 (Fed.Cir. 2002).

⁸⁹ Phillips, 415 F.3d at 1316 (“[O]ur cases recognize that the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.”).

⁹⁰ Safeflight, Inc. v. Chelton Flight Systems, Inc., 543 F.Supp.2d 779, 785 (N.D. Ohio 2008) (quoting Webster’s International Dictionary); See Oxford English Dictionary (“the things collectively in which th[e] preparation consists, and by which its processes are maintained; equipments, material, mechanism, machinery; material appendages or arrangements.”).

⁹¹ Doc. #1-1, p. 20, column 12, lines 31-32.

⁹² SanDisk Corp. v. Kingston Tech. Co., Inc., 695 F.3d 1348, 1360 (Fed.Cir. 2012); Koito Mfg. Co., Ltd. v. Turn-Key-Tech, L.L.C., 234 F.Supp.2d 1139, 1153 (S.D. Cal. 2002) (in patent parlance the normal meaning of “a” is “one or more”).

heating apparatus” as used in the patent-in-suit. The Court will not construe a claim term when the meaning or scope of the words is clear.⁹³ Neither Plaintiffs nor Marathon Oil have provided a convincing reason for changing the words.

d. “The Transportable Heating Apparatus is a Wheeled Vehicle” / “The Heating Apparatus is a Wheeled Vehicle”

Six of the asserted dependent claims provide that the transportable heating apparatus is a wheeled vehicle.⁹⁴ Defendants contend this term requires no construction.⁹⁵ Plaintiffs and Marathon Oil propose that the term be construed as follows: “A transportable heating apparatus that includes a wheeled vehicle.”⁹⁶ Plaintiffs assert the term ought to be construed since a wheeled vehicle is only one component of the transportable heating apparatus.

All parties note that the detailed description of the invention references the drawings and figures contained within the patent. The description provides as follows: “Mobile heater apparatus **12** is a transportable heating apparatus and includes a truck **13** and a trailer **14**.⁹⁷ The intrinsic evidence makes plain that a wheeled vehicle, as used in the patent-in-suit, includes a truck and a trailer. Modifying the claim language by omitting the word “is” and replacing it with “includes” is an exercise in superfluidity. The claim terms “the transportable heating apparatus is a wheeled vehicle” and “the heating apparatus is a wheeled vehicle” are plain. The Court finds it unnecessary to construe them.

⁹³ See U.S. Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed.Cir. 1997).

⁹⁴ Doc. #1-1, Claims 5, 18, 31, 41, 68, 91.

⁹⁵ Doc. #136-1, p. 9 of 11.

⁹⁶ Id.

⁹⁷ Doc. #1-1, p. 18, column 7, lines 9-10.

e. “Mixer”

Turning to the disputed claims terms at the heart of this litigation, the Court begins with the claim term “mixer”. At its most basic level, the patent-in-suit involves diverting a portion of a continuous flow of cold/cool water to a heating unit where the water is superheated and then reintroducing the superheated water to the cold/cold water until the target temperature is reached. An essential component in this process is a mixer.⁹⁸ The purpose of the mixer is to allow superheated water and cold/cool water to combine to achieve water temperature warmer than the source water.

The parties have proposed wildly divergent constructions for the term “mixer”. Defendants propose a broad construction: “Any pipe or tank configured to allow heated water to mix with continuously flowing source water.”⁹⁹ Plaintiffs and Marathon Oil propose a narrow construction in their brief: “A component with inlets for receiving cold water and heated water into a mixing chamber, a protrusion that creates turbulence in the flow entering the mixing chamber, and an outlet for discharging a mixture of the cold and heated water.”¹⁰⁰ At the Markman hearing, Plaintiffs proposed a new construction: “A component (or device or plumbing piece) with inlets for receiving cold (or ambient temperature) water and heated water into a mixing chamber, a protrusion (or other blockage or mechanical structure) that creates (or causes) turbulence in the flow entering the mixing chamber, and an outlet for discharging a mixture of the cold and heated water.”

⁹⁸ The patent uses the term “mixer” and “mixing manifold” interchangeably in the description section. The Court will use “mixer” for consistency.

⁹⁹ Doc. #136-1, p. 2 of 11.

¹⁰⁰ Id.

The Court is required to construe the patent terms independently according to the Phillips methodology. Beginning with the claim language itself, the mixer is specifically identified in the ‘993 Patent as a tubular body with a bore containing an inlet that receives cool/cold water from a source, a second inlet that enables heated water to enter the mixer, and an outlet that enables discharge of a mix of cold/cool water and heated water.¹⁰¹ An alternative includes a first inlet and a first outlet along with a second inlet enabling heated water to enter the mixer and a second outlet removing water from the mixer upstream of the second inlet.¹⁰² It is apparent that the precise location of the inlets and outlets on the mixer may vary.¹⁰³ It is equally apparent that the claims clearly provide for a mixing component (“mixer”) containing more than one inlet and at least one separate outlet. In other words, it is indisputable that the component identified as a mixer in the claim language possesses inlets and outlet(s).

Consistent with the claim language, the summary of the invention also identifies inlets and outlets on the mixer: “The [mixer] includes an intake opening and an outflow opening allowing the source flowing water to pass through the [mixer] to the frac tanks.”¹⁰⁴ The summary further notes that the mixer can be of any length or size of pipe, and the cold water diversion opening and the hot water return opening can be configured any number of ways that allows superheated water to mix with continuously flowing source water.¹⁰⁵

Likewise, the drawings identify the components of the mixer. The explanation of the

¹⁰¹ Claim 1(c),(d); 2; 13(c),(d); 14; 36(c),(d); 37; 63(c),(d); 64; 86(c),(d); 87.

¹⁰² Claim 26(c) - (e).

¹⁰³ Claim 1 (two inlets and one outlet); Claims 13, 26, 36, 86 (two inlets and two outlets); Claim 50 (second inlet with acute angle) Claim 63 (lateral inlet with acute angle).

¹⁰⁴ Doc. #1-1, p. 16, column 3, lines 37-39.

¹⁰⁵ Doc. #1-1, p. 16, column 4, lines 1-6.

drawings describes the mixer as a tubular or cylindrically-shaped body with a first inlet and a first outlet.¹⁰⁶ The drawings demonstrate that a second outlet removes ambient temperature water from the tubular body and a second inlet injects heated water into the tubular body.¹⁰⁷ The claim language as well as the intrinsic evidence make plain that the mixer, as claimed in the patent-in-suit, is a component with inlets for receiving cool/cold water and for reintroducing superheated water into a tubular pipe or tank and an outlet for discharging a mixture of cool/cold and heated water.

Defendants do not argue that Plaintiffs' and Marathon Oil's proposed constructions are inconsistent with the intrinsic evidence. Instead, they assert that the proposed constructions are redundant because the claims plainly require inlets and at least one outlet and thus the Court should not incorporate those aspects into the claim construction. There is a difference between construing the claims in light of the specification and improperly importing a limitation from the specification into the claims.¹⁰⁸ Construction of a particular term may incorporate claim language circumscribing the meaning of the term.¹⁰⁹ Including the presence of inlets and an outlet in the construction of the term "mixer" is a mutually reinforcing definition and not unnecessarily redundant.

While courts strive to reach a claim construction that does not render dependent claims meaningless, Defendants' proposed construction is overly generic and attempts to cast a far reaching net - one that has the potential to lead the public to believe the '993 Patent has a scope

¹⁰⁶ Doc. #1-1, p. 16, column 7, lines 27-30.

¹⁰⁷ Doc. #1-1, p. 18, column 7, lines 37-40.

¹⁰⁸ See Phillips, 415 F.3d at 1323.

¹⁰⁹ 01 Communique Laboratory, Inc. v. LogMeIn, Inc., 687 F.3d 1292, 1296 (Fed. Cir. 2012).

far greater than what was actually claimed in the subject invention. The patentee identified what it deemed were unique structural features of the mixer. Consistent with the intrinsic evidence contained within the subject invention, the Court construes the term “mixer” to mean a component with inlets for receiving water into a tubular pipe or tank and at least one outlet for discharging a mixture of cool/cold water and heated water from the tubular pipe or tank.¹¹⁰ This construction, however, does not end the discussion. The Court must also consider Plaintiffs’ and Marathon Oil’s assertion that the term “mixer” includes a protrusion, blockage, or mechanical structure to create or cause turbulence in the flow of the water.

The intrinsic evidence is not as overwhelming with regard to the issue of whether the term “mixer” as used in the patent-in-suit necessarily includes a structure to create turbulent flow. Claim 76 of the ‘993 Patent specifically identifies a wall portion that extends into the tubular bore.¹¹¹ The purpose of the wall is to generate turbulence. The other claims do not contain a specific mechanism that would cause the water to mix with turbulent flow. There are, however, several preferred embodiments listed in the summary of the invention that plainly suggest one or more mechanisms for creating turbulent flow, including: (1) a raised rigid semi-circle shaped lip extending from the backside of the cold water diversion opening to create a partial blockage or impediment of the source water and to direct a portion of the source water through piping to a heating unit, and also to create turbulence in the source water to aid in mixing at the superheated water inflow point;¹¹² (2) a hot water return opening located

¹¹⁰ Retractable Technologies, Inc. v. Becton, Dickinson and Co., 653 F.3d 1296, (Fed. Cir. 2011) (Courts “strive to capture the scope of the actual invention, rather than . . . allow the claim language to become divorced from what the specification conveys is the invention.”).

¹¹¹ Doc. #1-1, p. 23, column 17, lines 57-60.

¹¹² Doc. #1-1, p. 16, column 4, lines 21-26.

downstream of the cold water diversion opening;¹¹³ (3) a hot water return opening for delivery of superheated water with a lip extending into the stream of flowing water to create further turbulence in the water and resulting in greater mixing action;¹¹⁴ and (4) a lip on the front side of the hot water return opening providing a partial blocking of the cold water flow which is optimally of the same size and shape of the cold water diversion lip.¹¹⁵

The patentee of the subject invention expressly claimed to develop a unique mixing device. The undisputed purpose of the mixer is to combine cool/cold water and superheated water. The intrinsic evidence unambiguously provides for turbulence during the mixing phase. Defendants argue that one of the reasons Plaintiffs' and Marathon Oil's proposed construction should be rejected is because the protrusion or protruding lip identified by the patentee to create turbulence is "optional" and merely a "preferred" embodiment. "A claim construction that excludes the preferred embodiment is rarely, if ever, correct and would require highly persuasive evidentiary support."¹¹⁶ Finding no such persuasive evidentiary support, the Court declines Defendants' invitation to ignore the patent-in-suit's preferred embodiments simply because the patentee set forth preferences while also acknowledging that there are "numerous other conceivable arrangements and configurations of the inflow and outflow of the cold water and hot

¹¹³ Doc. #1-1, p. 16, column 4, lines 40-43.

¹¹⁴ Doc. #1-1, p. 16, column 4, lines 44-47.

¹¹⁵ Doc. #1-1, p. 16, column 4, lines 52-57.

¹¹⁶ Braintree Laboratories, Inc. v. Novel Laboratories, Inc., - - F.3d - -, 2014 WL 1584451, *5 (Fed.Cir. 2014) (quoting Adams Respiratory Therapeutics, Inc. v. Perrigo Co., 616 F.3d 1283, 1290 (Fed.Cir. 2010)); Butamax(TM) Advanced Biofuels LLC v. Gevo, Inc., - - F.3d - -, 2014 WL 593486, *9 (Fed. Cir. 2014) (quoting Oatey Co. v. IPS Corp., 514 F.3d 1271, 1276 (Fed.Cir. 2008)) ("[T]his court 'normally does not interpret claim terms in a way that excludes embodiments disclosed in the specification.'").

water and piping in the mixing manifold. . .”¹¹⁷

Defendants also contend that Plaintiffs’ and Marathon Oil’s proposed construction incorrectly imports a structure – namely a protrusion – that is not necessary to perform the component’s function. They claim the proposed construction runs afoul of the claim differentiation doctrine. Claim differentiation creates a presumption that the dependent claim limitations are not included in the independent claim.¹¹⁸ The “presumption can be overcome if the circumstances suggest a different explanation, or if the evidence favoring a different claim construction is strong.”¹¹⁹

Here, the dependent claims provide for the heated water and cool/cold water to “mix . . . with “turbulent flow.”¹²⁰ While Plaintiffs and Marathon Oil identify the form creating the turbulent flow as a protrusion, the parts list in the ‘993 Patent includes what are identified as “inner end portions” within the bore of the tubular body of the second inlet and outlet.¹²¹ According to the subject invention, it is preferred that these “inner end portions” have some sort of lip to partially block the flow of source water and induce suction and flow into the piping leading to the heating unit.¹²² In addition, the partial blockage aids in mixing at the heated water inflow point.¹²³

¹¹⁷ Doc. #1-1, p. 17, column 5, lines 25-28.

¹¹⁸ Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 911 (Fed.Cir. 2004).

¹¹⁹ Id.

¹²⁰ Doc. #1-1, Claims 4, 17, 30, 40, 54, 67, 80, 90.

¹²¹ Doc. #1-1, p. 20, column 11, line 58.

¹²² Doc. #1-1, p. 16, column 4, lines 23-28.

¹²³ Doc. #1-1, p. 16, column 4, lines 29-32.

Upon reading the specification as a whole, it is clear the patentee intended there to be something on the inner end portion of the second inlet and second outlet - whether it be a lip or some sort of wall - to create the desired “turbulent flow” in order to combine thoroughly the cool/cold water and the superheated water. In this case, the specification supports a construction that not only encompasses the preferred embodiment, but also reflects what the inventor actually claimed to invent. In the subject invention, the inventor claimed to invent a process for heating water on demand for use in the fracing industry. The process for heating the water includes a component for mixing cool/cold water with superheated water. In order to mix with the desired turbulent flow, the patentee claimed a mechanism in the “mixer” for partially blocking or impeding the water in order to ensure the heated water and cold/cool water thoroughly mix. After considering the intrinsic evidence, the Court construes the term “mixer” to mean “a component consisting of inlets for receiving cool/cold water and heated water into a tubular body, an internal structure to create or cause turbulent mixing, and an outlet for discharging a mixture of the cool/cold water and heated water.”¹²⁴ The Court believes this construction is consistent with the intrinsic evidence and accurately reflects what the inventor claimed in the ‘993 Patent.

f. Turbulent Flow

The final disputed term is “turbulent flow”. Asserted dependent claims 4, 17, 30, 67, and 90 require mixing cool/cold water and heated water with “turbulent flow.” In defining the claim term, the parties propose similar language. Plaintiffs and Marathon Oil contend turbulent flow means “flow in which water velocity varies erratically and direction changes in a swirling,

¹²⁴ *Retractable Technologies, Inc.*, 653 F.3d at 1305 (“a construction of ‘body’ that limits the term to a one-piece body is required to tether the claims to what the specifications indicate the inventor actually invented.”).

circular manner.” At the Markman hearing, Plaintiffs proposed a modified definition: “flow in which water velocity varies erratically and direction changes in a swirling, circular manner (different from that which is otherwise present in the system).” Defendants assert turbulent flow consists of “fluid moving in a chaotic fashion.” The sole dispute centers on whether the claim limitation requires water to move in a circular pattern.

To determine the ordinary and customary meaning of a claim term, courts turn to “those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean.”¹²⁵ A court determines the meaning of disputed claim terms by examining the claim language, as it relates to the invention set forth in the written description, the drawings, and where relevant the prosecution history.¹²⁶ As noted in the previous section regarding the claim term “mixer”, a preferred embodiment in the subject invention includes a raised part on the mixer’s inlets to block or obstruct water in such a way as to induce suction, create turbulence, and aid in mixing the source water and the heated water.¹²⁷ Curved, circular arrows in Figure 2 illustrate the referenced suction and turbulence to ensure the cool/cold water and heated water mix thoroughly.¹²⁸

Plaintiffs and Marathon Oil focus their attention on Figure 2, which uses curved arrows to demonstrate the flow, and they argue this figure limits the patent to an embodiment that only utilizes mixing in a circular pattern. The claim language, the brief summary of the invention, and the detailed description of the invention all refer to turbulent flow or turbulence. Nothing in

¹²⁵ Phillips, 415 F.3d at 1314 (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1116 (Fed.Cir. 2004)).

¹²⁶ Invitrogen Corp. v. Clontech Laboratories, Inc., 429 F.3d 1052, 1076 (Fed. Cir. 2005)

¹²⁷ Doc. #1-1, p. 16, column 4, lines 21-32.

¹²⁸ Doc. #1-1, p. 18, column 7, lines 33-35.

these sections of the patent limits the manner in which the water flows while mixing. Although the cross-section of the mixer shows circular flow, that does not automatically compel the conclusion that the patent is so narrowly tailored as to preclude the patentee from claiming other manners of mixing water.¹²⁹ “[A] technical term used in a patent document is interpreted as having the meaning that it would be given by persons experienced in the field of invention, unless it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning.”¹³⁰ The customary meaning of turbulent involves “the flow of a fluid in which the velocity at any point fluctuates irregularly and there is continual mixing rather than a steady flow pattern.”¹³¹ Nothing in the claim language or the specification indicates that the patentee used the term “turbulent flow” in a manner inconsistent with the plain meaning to a person of ordinary skill in the art. The Court construes the term “turbulent flow” to mean “the flow of fluid in which the velocity fluctuates randomly and irregularly and there is continual mixing rather than a steady flow pattern.”

g. Prosecution History

The parties have not relied on the prosecution history. Moreover, the Court finds no ambiguity or reason to consult the prosecution history. As such, the prosecution history is not recounted or analyzed in this order.

h. Extrinsic Evidence

While courts may consider extrinsic evidence to educate themselves about the patent and

¹²⁹ Lampi Corp. v. American Power Products, Inc., 228 F.3d 1365, 1379 (Fed. Cir. 2000).

¹³⁰ Outside the Box Innovations, LLC v. Travel Caddy, Inc., 695 F.3d 1285, 1309 (Fed. Cir. 2012) (quoting Hoechst Celanese Corp. v. BP Chems, Ltd., 78 F.3d 1575, 1578 (Fed. Cir. 1996)) (concluding that the drawings at issue were “merely a practical example of the invention” and did not limit the patent to identical half-shells).

¹³¹ Oxford English Dictionary, turbulent 2(c); found at: <http://www.oed.com/view/Entry/207572?redirectedFrom=turbulent#eid>

technology at issue, it is improper to rely on extrinsic evidence in construing claims unless, after consideration of all the intrinsic evidence, ambiguity remains.¹³² Finding no ambiguity in the intrinsic evidence, the Court will not consider any extrinsic evidence.

CONCLUSION

The claim language in dispute, the parties' proffered construction, and the court's own construction are summarized as follows:

Claim Term	Plaintiffs and Marathon Oil's Construction	Defendants' Construction	Court's Construction
<i>Substantially Continuously</i>	Ordinary meaning	Ordinary meaning	Ordinary meaning
<i>Much Greater</i>	Ordinary meaning	Ordinary meaning	Ordinary meaning
<i>Transportable Heating Apparatus</i>	A moveable machine or group of machines used to heat water	Ordinary meaning	Ordinary meaning
<i>Transportable Heating Apparatus is a Wheeled Vehicle / The Heating Apparatus is a Wheeled Vehicle</i>	A transportable heating apparatus that includes a wheeled vehicle	Ordinary meaning	Ordinary meaning

¹³² Mantech Envtl. Corp. v. Hudson Envtl. Servs., Inc., 152 F.3d 1368, 1373 (Fed. Cir. 1998).

<i>Mixer</i>	A component (or device or plumbing piece) with inlets for receiving cold (or ambient temperature) water and heated water into a mixing chamber, a protrusion (or other blockage or mechanical structure) that creates (or causes) turbulence in the flow entering the mixing chamber, and an outlet for discharging a mixture of the cold and heated water	Any pipe or tank configured to allow heated water to mix with continuously flowing source water	A component consisting of inlets for receiving cool/cold water and heated water into a tubular body, an internal structure to create or cause turbulent mixing, and an outlet for discharging a mixture of the cool/cold water and heated water
<i>Turbulent Flow</i>	Flow in which water velocity varies erratically and direction changes in a swirling, circular manner (different from that which is otherwise present in the system)	Where the fluid moves in a chaotic fashion	The flow of a fluid in which the velocity fluctuates randomly and irregularly and there is continual mixing rather than a steady flow pattern

The Court hereby adopts the foregoing as its construction of the patent claim terms in dispute.

IT IS SO ORDERED.

Dated this 7th day of July, 2014.

/s/ Ralph R. Erickson
Ralph R. Erickson, Chief Judge
United States District